32-Watt Linear T8 Lamps and High-Frequency Electronic Ballasts

Using this guide

This guide is designed to assist with procurement of 4-foot linear fluorescent lamps and high-frequency electronic ballasts primarily for retrofit applications. Retrofit refers to changing lamps and ballasts without replacing the entire fixture. The suggested technologies, high-frequency 32-Watt T8 lamps and high-frequency electronic ballasts, offer greater energy efficiency and higher quality illumination without sacrificing light levels. In order to achieve energy savings and reliable operation, the lamps must be used with electronic ballasts specified to operate the high-frequency 32-Watt T8 lamp.

High Frequency Electronic Ballast Specifications (to be used with 4-foot high-frequency 32-Watt T8 lamp)

Performance Characteristic	Specification (requirement)	Notes
Ballast Type	High-Frequency Electronic	
Mains (Building System) Frequency	50/60 Hz	Make sure the correct frequency is specified.
Mains (Building System) Voltage	127v/220v	Choose ballasts that match the voltage of your mains.
Total Harmonic Distortion (THD)	< 33%	Acceptable THD levels depend on the amount of sensitive electronics on your electrical system.
Voltage Tolerance	± 10% of mains voltage	This is especially important if voltage fluctuations are frequent.
Lamp Operating Frequency	> 20 kHz	
Power Factor (PF)	≥ .90 or in accordance with local regulations.	If fixtures include PF correction devices for magnetic ballasts, they should be removed when high PF electronic ballasts are installed.
Ballast Factor	.85 – 1.20	Choose a lower ballast factor if the area is overlit and save more energy. Choose a higher ballast factor if more light is needed.
Lamps/ballast	1 to 4	It may be possible in some cases to replace multiple magnetic ballasts with a single electronic ballast. Ballasts should always be specified for the number of lamps they will drive. Consult your lighting supplier or electrical contractor.
Circuit type	Instant-start or rapid-start	Instant-start is generally more efficient, but rapid-start is better if the lights are frequently switched on and off, as is the case when using occupancy sensors.
Current Crest Factor	< 1.7	
Manufacturer Warranty	At least three years	

32-Watt Linear T8 Fluorescent Lamp Specifications

Performance Characteristic	Specification (requirement)	Notes
Fluorescent Lamp Type	High-frequency linear T8	
Lamp Length	4 Feet (1200 mm)	
Lamp Wattage	32 Watts	Some T8s are 36W. The 32W lamps are the correct choice for use with high-frequency ballasts.
Color Rendering Index (CRI)	At least 75	This ensures high quality lighting as well as high efficiency. When possible, choose lamps with CRI greater than 80.
Color Temperature	Depends on user preference 4000K lamps are preferred for maximum efficacy (lumens/Watt).	32-Watt T8 high-frequency lamps are available in Kelvin color temperatures such as 3000, 3500, 4000, 5000, and 6500. Higher color temperatures produce cooler light. They usually are referred to by names such as "Cool White." Match color temperature to occupant preferences.
Rated Lamp Life	Minimum 20,000 hours rating	The rated life is the expected number of burn hours until 50% of the lamps have burnt out.

Procurement Checklist

- ❑ Lamp/Ballast Compatibility: Electronic ballasts must be specified to operate 32W high-frequency T8 lamps. Using a ballast not specified to operate a 32W high-frequency T8 lamp will reduce lamp life by as much as 50%.
- ❑ Verification of the Technologies: Upon purchase and delivery of the lamps and ballasts, purchasers (building owners and tenants) should inspect the shipment to verify the proper lamps and ballasts were delivered.
- ❑ Replacement Lamp: Purchasers should check with local suppliers for availability of replacement lamps and ballasts to be purchased in small quantities. Suppliers should stock adequate supplies (lamps and ballasts) to meet replacement orders by building owners and tenants. Make sure that lamps of the correct color temperature will be available. Occupants will see differences in color temperature, which may detract from their satisfaction.
- ❑ Warranty: The terms of the warranty should be discussed and understood by the purchaser. The discussion should include details about how quality problems will be addressed.

The United States Environmental Protection Agency (EPA) has provided this document through eeBuildings. The goal of eeBuildings is to help owners and managers of office buildings profitably improve their energy efficiency and thereby reduce atmospheric emissions associated with the generation of electricity. ICF Consulting assists EPA in implementing eeBuildings.

Contact: Gary McNeil, US EPA, mcneil.gary@epa.gov
Steve Bagley, ICF, sbagley@icfconsulting.com